NCMC-9 Discussion Session, 04-24-06
Flipchart Notes

1. Scope of Metrology Needs
    a. All Aspects
    b. Formulation
        i. Raw Materials
        ii. New Products
    c. Combi for initial screening “Sweet Spot”
    d. Basic R&D
    e. Nanostructure???
    f. Variables—mascara example
    g. Industry/Disruptive Technology
    h. Sample Preparation
    i. Quality Control
    j. Exfoliation Rates
    k. Bottlenecks
        i. Sample Preparation
        ii. Huge Backlogs
        iii. Kinetics
        iv. Troubleshooting
        v. Measurement
        vi. Magnitude of Size/Scale (Reduction)

2. Key Materials Properties
    a. Nano
    b. Individual Domain
    c. Degree of Exfoliation
    d. Starting Material Quality
        i. Carbon Nanotubes
    e. Size, Shape, Composition
        i. Chemical Analysis & Composition
    f. Rheology (Complex)
        i. Relation to Performance
        ii. Wide Range
    g. Stability
    h. Light Scattering
    i. Zeta Potential
    j. Dispersion
    k. Surfaces & Interfaces
        i. Composition & Distribution
        ii. Identify Properties
        iii. Repeatability
        iv. HT as a Reductionist Method
        v. Standardized Nomenclature
        vi. Bio Properties

l. Test Format
    i. Films
    ii. Marongoni Effects
    iii. Reliability
    iv. Multifunctional Materials & Measurements Correlated

3. Key Test Methods
    a. TEM
        i. Structure
        ii. Internal Particle Structure
        iii. Fluorescence (X-Ray)
        iv. Sample
    b. AFM
        i. Sample (In-Situ Measurements)
        ii. Advance Modes – Considering
        iii. Integration
        iv. Nanoindentation
            1. Defects
            2. Reproducibility
    c. FESEN
        i. Surface Structure
        ii. Sample Preparation & Analysis
    d. Scattering
        i. Link to Rheology
        ii. Rate of Determining Step (Not HT Yet)
        iii. X-Ray
            1. High-Throughput, Automated Platform
            2. Diffraction
            3. SAXS (Sparsely Used)
        iv. Surface Roughness
    e. Spectroscopic
        i. XRF
        ii. RAMAN
        iii. UV-VIS
        iv. Magnetic (SQUID)
        v. Fluorescence
        vi. IR
        vii. Microscopy
    f. Measurement Selection
        i. Guidelines
    g. Sounds/Acoustics
        i. Case-by-Case
        ii. Stability
        iii. Quantitative Challenge
        iv. Multiple Frequencies
        v. Production Control

h. Electrical/Thermal Properties
    i. Dialectic/Conduction
    ii. Application Specific
    iii. Reliable Sample Preparation
i. High-Throughput
    i. Libraries – Quality
    ii. Deconvoluting Factors (Artifacts)
        1. Film Thickness
    iii. Sample & Combi Prep
    iv. Screening Quality
    v. Quality is more important than Data
j. Rheology (Complex) < 15 ml, Melts